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The Effect of Gender and Age on PPST Performance in an Urban Teacher Education Program

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THE EFFECT OF GENDER AND AGE ON PPST PERFORMANCE IN AN URBAN TEACHER EDUCATION PROGRAM

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This study examined PPST scores for 318 College of Education students in a midsized, midwestern, urban university. Factors of gender and age were used to compare performance on the three PPST subtests of Reading, Writing and Mathematics. Findings tended to support some gender-stereotypical beliefs with regard to math and verbal abilities. The study's findings did not support the often perceived belief that traditional students outperform nontraditional students. Inferences for urban colleges of Education are discussed.

In the state of Nebraska as in many other states, Education students are required to take the Pre-Professional Skills Test (PPST) as a way of assuring that potential teachers possess fundamental skills in the essential areas of reading, writing and mathematics. The PPST, developed and published by the Educational Testing Service (ETS, 1986), consists of a battery of three subtests designed to provide objective, standardized measures of essential proficiency in reading, mathematics and writing (Goodison, 1985). Each subtest consists of multiple choice questions: 40 in reading, 40 in math, and 45 in writing. An essay is also included with the score of the writing section reflecting a combination of the written essay and multiple choice items correct (Hicken, 1992). While this test has been widely used across the nation, a review of the literature found little research had been done with regard to the performance of reentering adults on a test of basic skills which could be assumed had not been a part of their recent learning experiences.

Institutions of higher education in urban settings typically attract large numbers of adult students (over 23 years of age) while, nationally, colleges of Education generally report more female than male students. The College of Education at the University of Nebraska at Omaha (UNO) is representative of both trends with 71% of its current undergraduate students being female vs. 29% male and a total of 47% of the Education students being reentering adults.

Frequently associated with these trends are concerns commonly voiced by adult students that they will be outperformed by their younger, more traditional age counterparts (Harrington, Davis and Harrington, 1992). In addition, a widely held belief is that men score higher on standardized math tests while women score higher on standardized tests measuring language abilities (Daly, Bell & Korinek, 1987). This study was designed to assess the validity of these beliefs and to determine what the ramifications might be for teacher education programs in urban settings. The research question, therefore, became is there any difference on any of the three subtests of the PPST scores when comparing for gender and age, and are there any interactions between gender and age on those same scores?

Method

Variables

The *dependent variables* in this study are the ex post facto scores on all three subtests of the PPST (reading, math and writing). The *organismic variables*, which functioned as

independent variables in analyzing the results, were gender and age. Age differences were grouped into tow categories: traditional (23 years old and younger) and non-traditional (24 years old and older).

Sample

The subjects were 318 students who took the PPST in the college of Education at a mid-sized (17,000), midwestern urban university during a recent two-year period. Scores were obtained via the College of Education from approximately 500 students who were identified by social security number (SSN) only. Listed with the SSN were each individual's birthdate and gender and the scores received on all three subtest on the PPST. Since only about one-third of the students (172) on the list were male (which corresponds closely with the current male enrollment in the College of Education), it was decided to use only half of the females listed in order to have approximately equal numbers of males and females for the study. All females on the list were assigned a number in numerical order and then using a Table of Random Numbers (Borg and Gall, 1983). Half of the females were randomly selected for the study. The resultant N for females was 159 with the total N equalling 318. Of the 318 subjects, 188 were nontraditional and 130 were traditional age students.

Analysis Procedures

The ex post facto data was examined using a two-way analysis of variance (ANOVA) as it possessed the capability to determine whether group scores on one or more variables differed significantly from each other and whether there was any significant interaction between the two variables. The two variables were gender and age.

Results

Descriptive data

Reading subtest: The range of scores on this subtest ran from 161 to 190 (a perfect score). The mean score was 179 with 170 representing the passing score needed in the state of Nebraska.

Math subtest: the range of scores ran from 160 to 190, and the mean score was 179 with 171 representing a passing score.

Writing subtest: the range went from 166 to 190 which represented a smaller range than on the other two subtests: however, the mean score of 176 was lower than the means on the other two subtests although higher than the required 172 to meet Nebraska state standards.

Analysis of Variance

Results of the ANOVA found significant differences three different times on the main effects of age or gender. In addition, statistically significant interaction occurred between gender and age on one subtest (see Table 1). Results on the Math subtest indicate the scores of males ($\overline{X}$=180.83) were significantly higher than the scores for females ($\overline{X}$=178.46). The F value of 9.611 was statistically significant ($p<.01$). The Writing subtest also showed a significant difference ($p<.05$) on the gender variable, but the difference favored females with a F value of 4.019. The mean score for females was 176.59, and the mean score for males was 175.67. A significant difference ($p<.01$) was also present on the Reading subtest but on the main effect of age. Older students (over 24 years of age) did significantly better ($p<.01$) than younger students (23 and younger) with a F value of 13.948. The mean score for older students was 179.92 while the mean for younger students was 177.65. In addition, the two-way interaction on the Reading subtest indicated that older females outscored older males (female $\overline{X}$=180.57; male $\overline{X}$=179.44); however, that order was reversed for traditional students with younger males scoring significantly higher ($\overline{X}$=178.38) than younger females ($\overline{X}$=177.07). This two-way interaction with a F value of 4.014 was statistically significant at the $p<.05$ level.

Discussion

This research began by asking the question: is there a difference on any of the three subtests scores of the PPST when examining the gender factor, the age factor, and is there any interaction between those two. The answer was affirmative in that a statistically significant difference was found on one or the other of the main effects of age and gender on each subtest. In two of the subtests, the difference would seem to support commonly held beliefs about gender abilities. Males did, indeed, perform better ($p<.01$) on the Math subtest. On the Writing subtest, females evidence a better performance ($p<.05$) which would tend to support the hypothesis that women do better on language-related tasks. However, while many non-traditional students frequently voice the belief that traditional students frequently voice the belief that traditional students perform better on standardized tests such as the PPST, the Reading subtest showed a significant difference at the $p<.001$ level in favor of older students.

A further very interesting finding was that on this same Reading subtest while findings for the nontraditional students met expectations that females do better on language-related tasks, traditional males did better than their traditional female counterparts.

This was an unexpected finding that raised other questions. Did performance of the younger, traditional females reflect the movement away from teaching careers by the more able females in this age group? Did the performance by both traditional and nontraditional students on the Reading subtest indicate that traditional students, as a group entering Education, were not as well trained in reading as their older counterparts, or were they reflecting a generational trend away from the choice of Education as a career by the most capable students? Further research needs to be conducted in other colleges of Education both in urban commuter settings and on residential campuses to determine if this is a nationwide trend.

The concern of older students that they would be outperformed by younger counterparts proved unfounded as nontraditional students consistently scored higher than traditional students on every subtest with statistical significance of $p<.001$ achieved on the Reading subtest. While this may allay fears on the part of nontraditional students, it could also raise a concern on the part of teacher educators with regard to the reading skill of traditional students. Ramifications for urban colleges of Education may include recruitment efforts being directed specifically toward older nontraditional students while continuing to attempt to attract the more capable traditional students.

(Continued on page 76)

Table 1
Analysis of Variance on 3 PPST Subtests

	Reading		Math		Writing	
	F	P	F	P	F	P
Status Age (A)	13.948	.000**	.573	.450	2.212	.138
Gender (B)	.048	.827	9.611	.002**	4.019	.046*
2-Way interaction (A x B)	4.014	.046*	.811	.369	1.240	.266

* $p < .05$ ** $p < .01$

enough) and build successes on that because there is a very real motivation to fail.

3. Front load efforts on building significance and competence which involves both public praise of the work and personal encouragement of the student's effort.
4. Demonstrate unconditional positive regard by deeply caring, understanding, showing enthusiasm, and modeling appropriate behavior. Positive regard builds significance in children.
5. Maintain student attention and involvement ("momentum" in the research literature) by teaching what is relevant and teleological (goal directed toward new learning).
6. Use a hierarchy of classroom management styles. Begin and seek to operate at a non-interventionist/referent authority position, and as situations dictate move with fluidity to a more structured constructivist/expert authority stance and if necessary to an interventionist/reward-consequence situation.

This list is obviously not exhaustive, but it does give a sampling of practical ideas we employ daily in the education of socially and emotionally disturbed children. These same ideas can be used in other settings such as regular and alternative education programs where whole learning is being welcomed.

The emotional support classroom offers a paradigm of what genuine whole learning is all about. It seeks to teach the whole person–mind, body and emotions. Hopefully others in the education community will learn from the example and incorporate the philosophy by making it their own.

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The Effect of Gender ...

(Continued from page 144)

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